Health Advisory: SARS

Identification and Evaluation of Possible SARS-CoV Disease

January 13, 2004

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Health Advisory
January 13, 2004

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SUBJECT: **Clinical Guidance on the Identification and Evaluation of Possible SARS-CoV Disease among Persons Presenting with Community-Acquired Illness**

[This Health Advisory replaces the December 22, 2003, Health Advisory: "Severe Acute Respiratory Syndrome (SARS): Identification and Evaluation of Possible SARS-CoV Disease Among Persons Presenting With Community-Acquired Illness."]

Severe acute respiratory syndrome (SARS), caused by SARS-associated coronavirus (SARS-CoV), is a serious, potentially fatal, infectious disease. Undetected SARS cases are of particular concern because of their potential to trigger rapid transmission of SARS-CoV and generate substantial health, social, and economic consequences. Early recognition of cases and application of appropriate infection control measures are critical in controlling possible future outbreaks of the disease.

The Centers for Disease Control and Prevention (CDC) previously issued guidance on the identification and evaluation of possible SARS-CoV infection among persons presenting with fever and/or respiratory illness. This earlier guidance was summarized in the December 22, 2003, Health Advisory: "Severe Acute Respiratory Syndrome (SARS): Identification and Evaluation of Possible SARS-CoV Disease Among Persons Presenting With Community-Acquired Illness." More recently, CDC has issued updated guidance (available at http://www.cdc.gov/ncidod/sars/clinicalguidance.htm) on the clinical evaluation and management of patients who present from the community with fever and/or respiratory illnesses. This updated version clarifies that, in a setting of ongoing SARS-CoV transmission in a facility or community, the presence of either fever or lower respiratory symptoms should prompt further evaluation for SARS-CoV disease. In addition, in accordance with the new SARS case definition, when persons have a high risk of exposure to SARS-CoV (e.g., persons previously identified through contact tracing or self-identified as close contacts of a laboratory-confirmed case of SARS-CoV disease; persons who are epidemiologically linked to a laboratory-confirmed case of SARS-CoV disease), the clinical screening criteria should be expanded to include, in addition to fever or lower respiratory symptoms, the presence of other early symptoms of SARS-CoV disease.

This Health Advisory (which replaces the December 22, 2003, SARS Health Advisory) summarizes the key points of the updated CDC guidance document.

More information on SARS is available from CDC at http://www.cdc.gov/ncidod/sars/. See also the SARS information on the Missouri Department of Health & Senior Services (DHSS) website at http://www.dhss.state.mo.us/ (click on "SARS"). Specific questions should be addressed to DHSS's disease investigation unit at 573/751-6268 or after-hours at 1-800-392-0272.

The vast majority of patients with SARS-CoV disease: 1) have a clear history of exposure either to a SARS patient(s) or to a setting in which SARS-CoV transmission is occurring, and 2) develop pneumonia.
To date, no specific clinical or laboratory findings can distinguish with certainty SARS-CoV disease from other respiratory illnesses rapidly enough to inform management decisions that must be made soon after the patient presents to the healthcare system. Therefore, **early clinical recognition of SARS-CoV disease still relies on a combination of clinical and epidemiologic features**.

The diagnosis of SARS-CoV disease and the implementation of control measures should be based on the risk of exposure.

- In the absence of any person-to-person transmission of SARS-CoV worldwide, the overall likelihood that a patient being evaluated for fever or respiratory illness has SARS-CoV disease will be exceedingly low unless there are both typical clinical findings and some accompanying epidemiologic evidence that raises the suspicion of exposure to SARS-CoV.
- Once person-to-person SARS-CoV transmission has been documented anywhere in the world, the positive predictive value of even early clinical symptoms (e.g., fever or lower respiratory symptoms in the absence of pneumonia), while still low, may be sufficiently high -- when combined with an epidemiologic link to settings in which SARS-CoV has been documented -- to lead clinicians to consider a diagnosis of SARS-CoV disease.

The following is an approach for the evaluation of possible SARS-CoV disease among persons presenting with community-acquired illness.

Diagnosis of SARS-CoV Disease

In the absence of person-to-person transmission of SARS-CoV anywhere in the world, the diagnosis of SARS-CoV disease should be considered only in patients who require hospitalization for radiographically confirmed pneumonia and who have an epidemiologic history that raises the suspicion of SARS-CoV disease. The suspicion for SARS-CoV disease is raised if, within 10 days of symptom onset, the patient:

- Has a history of recent travel to mainland China, Hong Kong, or Taiwan (see Figure 1, footnote 3) or close contact[1] with ill persons with a history of recent travel to such areas, OR
- Is employed in an occupation at particular risk for SARS-CoV exposure, including a healthcare worker with direct patient contact or a worker in a laboratory that contains live SARS-CoV, OR
- Is part of a cluster of cases of atypical pneumonia without an alternative diagnosis

Persons with such a clinical and exposure history should be evaluated according to the algorithm in **Figure 1.**

Once person-to-person transmission of SARS-CoV has been documented in the world, the diagnosis should still be considered in patients who require hospitalization for pneumonia and who have the epidemiologic history described above. In addition, all patients with fever or lower respiratory symptoms (e.g., cough, shortness of breath, difficulty breathing) should be questioned about whether within 10 days of symptom onset they have had:

- Close contact with someone suspected of having SARS-CoV disease, OR
- A history of foreign travel (or close contact with an ill person with a history of travel) to a location with documented or suspected SARS-CoV, OR
- Exposure to a domestic location with documented or suspected SARS-CoV (including a laboratory that contains live SARS-CoV), or close contact with an ill person with such an exposure history.

Persons with such an exposure history should be evaluated for SARS-CoV disease according to the algorithm in **Figure 2.**

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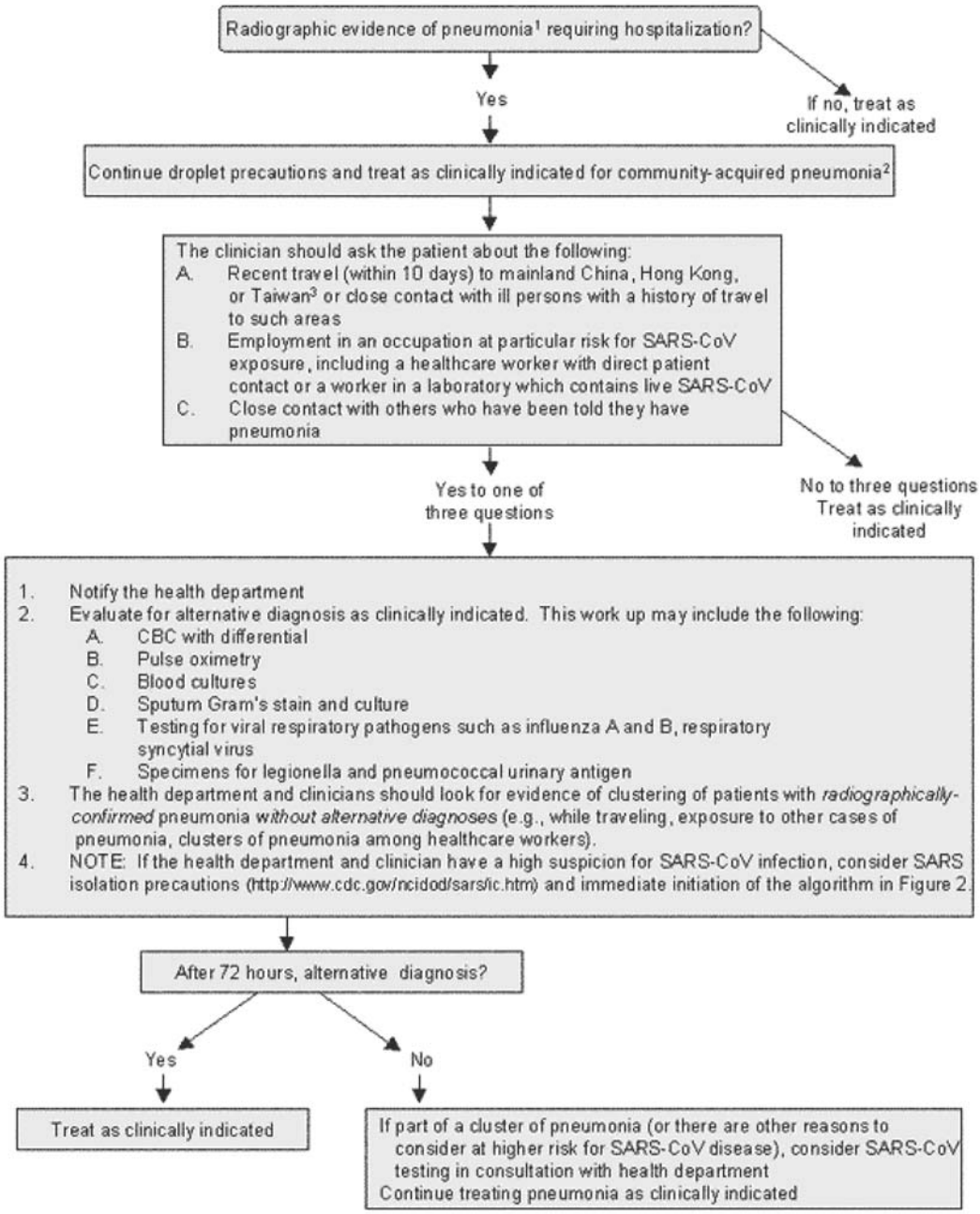
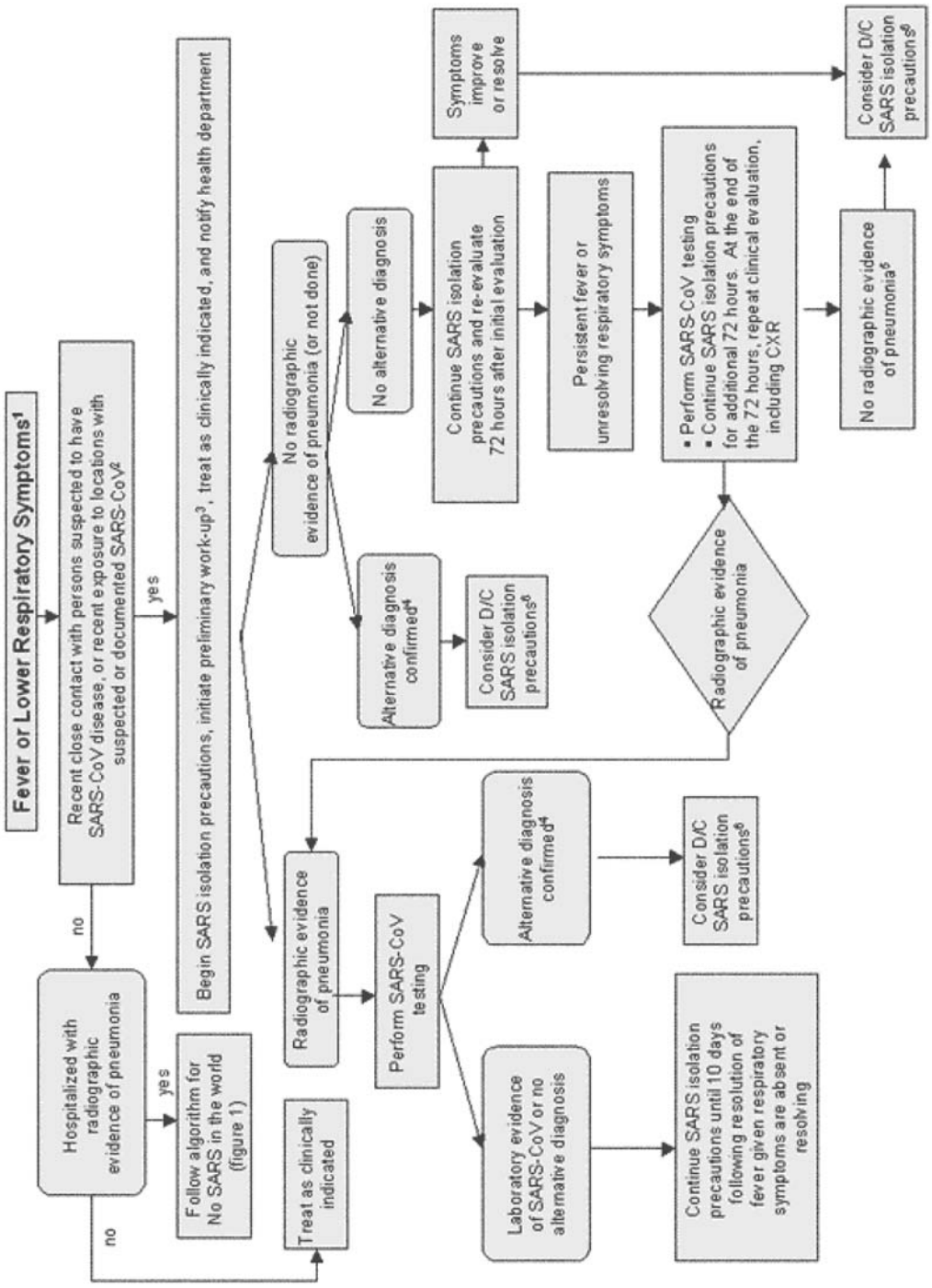
[1] Close contact: A person who has cared for or lived with a person with SARS-CoV disease or had a high likelihood of direct contact with respiratory secretions and/or body fluids of a person with SARS-CoV disease. Examples of close contact include kissing or hugging, sharing eating or drinking utensils, talking within 3 feet, and direct touching. Close contact does not include activities such as walking by a person or briefly sitting across a waiting room or office.

Figure 1: Algorithm for evaluation and management of patients requiring hospitalization for radiographically confirmed pneumonia, in the absence of person-to-person transmission of SARS-CoV in the world



1. Or Acute Respiratory Distress Syndrome (ARDS) of unknown etiology
2. Guidance for the management of community-acquired pneumonia is available from the Infectious Diseases Society of America (IDSA) and can be found at www.journals.uchicago.edu/IDSA/guidelines/.
3. The 2003 SARS-CoV outbreak likely originated in mainland China, and neighboring areas such as Taiwan and Hong Kong are thought to be at higher risk due to the high volume of travelers from mainland China. Although less likely, SARS-CoV may also reappear from other previously affected areas. Therefore, clinicians should obtain a complete travel history. If clinicians have concerns about the possibility of SARS-CoV disease in a patient with a history of travel to other previously affected areas (e.g., while traveling abroad, had close contact with another person with pneumonia of unknown etiology or spent time in a hospital in which patients with acute respiratory disease were treated), they should contact the health department.

Figure 2: Algorithm for management of patients with fever or lower respiratory symptoms when person-to-person transmission of SARS-CoV is occurring in the world



1. Clinical description of SARS-CoV disease and approach to treatment:

   Clinical judgment should be used to determine when symptoms trigger initiation of the algorithm in Figure 2. The early symptoms of SARS-CoV disease usually include fever, chills, rigors, myalgia, and headache. In some patients, myalgia and headache may precede the onset of fever by 12-24 hours. Respiratory symptoms often do not appear until 2-7 days after the onset of illness and most often include shortness of breath and/or dry cough. Diarrhea, sore throat, and rhinorrhea may also be early symptoms of SARS-CoV disease.

In the absence of fever, when screening patients for potential SARS-CoV disease, respiratory symptoms that would trigger the clinical algorithm are generally defined as lower respiratory tract symptoms (e.g., cough, shortness of breath, difficulty breathing). However, when screening patients who have a high risk of exposure to SARS-CoV (e.g., persons previously identified through contact tracing or self-identified as close contacts of a laboratory-confirmed case of SARS-CoV disease; persons who are epidemiologically linked to a laboratory-confirmed case of SARS-CoV disease), symptoms that should trigger the clinical algorithm should be expanded to include any of the following: sore throat, rhinorrhea, chills, rigors, myalgia, headache, diarrhea.

Although not diagnostic, the following laboratory abnormalities have been seen in some patients with laboratory-confirmed SARS-CoV disease:

- Lymphopenia with normal or low white blood cell count
- Elevated hepatic transaminases
- Elevated creatine phosphokinase
- Elevated lactate dehydrogenase
- Elevated C-reactive protein
- Prolonged activated partial thromboplastin time

As of 1 December 2003, no specific treatment recommendations can be made for management of SARS-CoV disease. Empiric therapy for community-acquired pneumonia should include treatment for organisms associated with any community-acquired pneumonia of unclear etiology, including agents with activity against both typical and atypical respiratory pathogens. Treatment choices may be influenced by both the severity of and the circumstances surrounding the illness. Infectious disease consultation is recommended. The Infectious Diseases Society of America has guidelines for the management of community-acquired pneumonia (www.journals.uchicago.edu/IDSA/guidelines/).

2. Exposure history for SARS-CoV, once SARS-CoV transmission is documented in the world:

In settings of no or limited local secondary transmission of SARS-CoV, patients are considered exposed to SARS-CoV if, within 10 days of symptom onset, the patient has:

- Close contact with someone suspected of having SARS-CoV disease, *OR*
- A history of foreign travel (or close contact with an ill person with a history of travel) to a location with documented or suspected SARS-CoV, *OR*
- Exposure to a domestic location with documented or suspected SARS-CoV (including a laboratory that contains live SARS-CoV), or close contact with an ill person with such an exposure history.

In settings with more extensive transmission, all patients with fever or lower respiratory symptoms should be evaluated for possible SARS-CoV disease, since the ability to determine epidemiologic links will be lost.

For up-to-date information on where recent SARS-CoV transmission is suspected or documented, see the CDC and WHO websites: www.cdc.gov/sars and www.who.int.

3. Clinical work-up: Clinicians should work up patients as clinically indicated. Depending on symptoms and exposure history, initial diagnostic testing for patients with suspected SARS-CoV disease may include:

- Complete blood count (CBC) with differential
- Chest radiograph
- Pulse oximetry
- Blood cultures
- Sputum Gram's stain and culture
- Testing for viral respiratory pathogens, notably influenza A and B and respiratory syncytial virus
- Legionella and pneumococcal urinary antigen testing if radiographic evidence of pneumonia (adults only)

An acute serum sample and other available clinical specimens (respiratory, blood, and stool) should be saved for additional testing until a specific diagnosis is made.

SARS-CoV testing may be considered as part of the initial work-up if there is a high level of suspicion for SARS-CoV disease based on exposure history. For additional details on specialized laboratory testing options available through the health department and the Laboratory Response Network (LRN), see CDC's SARS website (www.cdc.gov/sars/). [See also the Missouri State Public Health Laboratory SARS website at http://www.dhss.state.mo.us/Lab/VirologySARS.htm.]

4. Alternative diagnosis:

An alternative diagnosis should be based only on laboratory tests with high positive-predictive value (e.g., blood culture, viral culture, Legionella urinary antigen, pleural fluid culture, transthoracic aspirate). In some settings, PCR testing for bacterial and viral pathogens can also be used to help establish alternative diagnoses. The presence of an alternative diagnosis does not necessarily rule out co-infection with SARS-CoV.

5. Radiographic testing:

   Chest CT may show evidence of an infiltrate before a chest radiograph (CXR). Therefore, a chest CT should be considered in patients with a strong epidemiologic link to a known case of SARS-CoV disease and a negative CXR 6 days after onset of symptoms. Alternatively, the patient should remain in SARS isolation, and the CXR should be repeated on day 9 after symptom onset.

6. Discontinuation of SARS isolation precautions:

   SARS isolation precautions should be discontinued only after consultation with the local public health authorities and the evaluating clinician. Factors that might be considered include the strength of the epidemiologic exposure to SARS-CoV, nature of contact with others in the residential or work setting, strength of evidence for an alternative diagnosis, and evidence for clustering of pneumonia among close contacts. Isolation precautions should be discontinued on the basis of an alternative diagnosis only when the following criteria are met:

   - Absence of strong epidemiologic link to known cases of SARS-CoV disease
   - Alternative diagnosis confirmed using a test with a high positive-predictive value
   - Clinical manifestations entirely explained by the alternative diagnosis
   - No evidence of clustering of pneumonia cases among close contacts (unless >1 case in the cluster is confirmed to have the same alternative diagnosis)
   - All cases of presumed SARS-CoV disease identified in the surrounding community can be epidemiologically linked to known cases or locations in which transmission is known to have occurred.

Additional Guidance

Pediatric Populations

In the absence of person-to-person SARS-CoV transmission in the world, evaluation and management for possible SARS-CoV disease should be considered only for adults, unless special circumstances make the clinician and health department consider a child to be of potentially high risk for having SARS-CoV disease.

In the presence of person-to-person SARS-CoV transmission in the world, the evaluation algorithm established for adults can be used in children with the following caveats:

- Both the rate of development of radiographically confirmed pneumonia and the timing of development of such radiographic changes in children are unknown.
- The positive predictive value of rapid virus antigen detection tests (e.g., RSV) "in season" will be higher in a pediatric population.
- Pneumococcal and legionella urinary antigen testing are not recommended for routine diagnostic use in children.

Elderly persons and patients with underlying chronic illnesses

Typical symptoms of SARS-CoV disease may not always be present in elderly patients and those with underlying chronic illnesses, such as renal failure. Therefore, the diagnosis should be considered for almost any change in health status, even in the absence of typical clinical features of SARS-CoV disease, when such patients have epidemiologic risk factors for SARS-CoV disease (e.g., close contact with someone suspected to have SARS-CoV disease or exposure to a location [domestic or international] with documented or suspected recent transmission of SARS-CoV).